AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. - 3. (canceled)

4. (previously presented) An electronic control unit comprising a first computer and a second computer and outputting a control signal for an object of control based on a predetermined detection signal, the first computer comprising:

a determination routine unit operable to, in order to check an abnormal state of a logic function for operating the control signal based on the predetermined detection signal, operate a dummy control signal by using dummy data stored in advance in accordance with the logic function and to determine whether or not a relationship between the dummy control signal and an expected value of the dummy control signal, which expected value is stored with respect to the dummy data in advance, is normal; and

a transmission unit operable to transmit the dummy control signal and the expected value thereof that are used in a determination routine by the determination routine unit to the second computer;

the second computer comprising:

a receiving unit operable to receive the dummy control signal and the expected value thereof; and

a monitor routine unit operable to compare the dummy control signal and the expected value thereof received by the receiving unit so as to perform a calculation

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routine for calculating monitor data for monitoring whether or not a result of the

determination routine by the determination routine unit is correct;

wherein the electronic control unit further comprises: a fail-safe routine unit

operable to perform a fail-safe routine based on the determination result by the

determination routine unit and the monitor data by the monitor routine unit;

the logic function includes a first logic function for operating the control signal

based on the predetermined detection signal and a second logic function, for operating a

simplified control signal based on the predetermined detection signal;

the determination routine unit further determines whether or not a relationship

between the control signal operated in accordance with the first logic function and the

simplified control signal operated in accordance with the second logic function is normal;

and

the transmission unit transmits the control signal and the simplified control signal,

as well as the dummy control signal and the expected value thereof, to the second

computer, and the monitor routine unit further compares the control signal with the

simplified control signal to perform a calculation routine for calculating the monitor data

for monitoring whether or not a result of the determination routine in the determination

routine unit is correct.

5. (previously presented) An electronic control unit comprising a first

computer and a second computer and outputting a control signal for an object of control

based on a predetermined detection signal, the first computer comprising:

a determination routine unit operable to, in order to check an abnormal state of a

logic function for operating the control signal based on the predetermined detection

signal, operate a dummy control signal by using dummy data stored in advance in

accordance with the logic function and to determine whether or not a relationship

between the dummy control signal and an expected value of the dummy control signal,

which expected value is stored with respect to the dummy data in advance, is normal; and

a transmission unit operable to transmit the dummy control signal and the

expected value thereof that are used in a determination routine by the determination

routine unit to the second computer;

the second computer comprising:

a receiving unit operable to receive the dummy control signal and the expected

value thereof; and

a monitor routine unit operable to compare the dummy control signal and the

expected value thereof received by the receiving unit so as to perform a calculation

routine for calculating monitor data for monitoring whether or not a result of the

determination routine by the determination routine unit is correct;

wherein the electronic control unit further comprises: a fail-safe routine unit

operable to perform a fail-safe routine based on the determination result by the

determination routine unit and the monitor data by the monitor routine unit;

a plurality of types of the dummy data are prepared;

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when the determination routine unit determines that the relationship between the

dummy control signal and the expected value thereof is normal, the determination routine

unit repeats the determination routine while changing the plurality of types of dummy

data; and

when the determination routine unit determines that the relationship between the

dummy control signal and the expected value thereof is abnormal in the previous

determination routine, the determination routine unit operates the dummy control signal

by using the same dummy data as that used in the previous determination routine and

determines whether or not the relationship between the thus calculated dummy control

signal and the expected value thereof is normal again.

6.   (previously presented) An electronic control unit comprising a first

computer and a second computer and outputting a control signal for an object of control

based on a predetermined detection signal, the first computer comprising:

a determination routine unit operable to, in order to check an abnormal state of a

logic function for operating the control signal based on the predetermined detection

signal, operate a dummy control signal by using dummy data stored in advance in

accordance with the logic function and to determine whether or not a relationship

between the dummy control signal and an expected value of the dummy control signal,

which expected value is stored with respect to the dummy data in advance, is normal; and

a transmission unit operable to transmit the dummy control signal and the

expected value thereof that are used in a determination routine by the determination

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routine unit to the second computer;

the second computer comprising:

a receiving unit operable to receive the dummy control signal and the expected value thereof; and

a monitor routine unit operable to compare the dummy control signal and the expected value thereof received by the receiving unit so as to perform a calculation routine for calculating monitor data for monitoring whether or not a result of the determination routine by the determination routine unit is correct;

wherein the electronic control unit further comprises: a fail-safe routine unit operable to perform a fail-safe routine based on the determination result by the determination routine unit and the monitor data by the monitor routine unit;

in a case where it is determined, in the determination by the determination routine unit whether the relationship between the dummy control signal and the expected value thereof is normal or abnormal, that the relationship is abnormal a predetermined number of times, or in a case where the monitor data indicating that the determination routine by the determination routine unit is to determine that the relationship between the dummy control signal and the expected value thereof is abnormal is calculated in the monitor routine unit a predetermined number of times, the abnormal state of the determination routine is settled and the fail-safe routine unit performs different fail-safe routines before and after settlement of the abnormal state, respectively.

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7.   (original)   The electronic control unit according to claim 6, wherein

the fail-safe routine allows the output of the control signal to the object of control

before the settlement of the abnormal state, and prohibits the control of the object of

control by the control signal after settlement of the abnormal state.

8.   (previously presented) An electronic control unit comprising a first

computer and a second computer and outputting a control signal for an object of control

based on a predetermined detection signal, the first computer comprising:

a determination routine unit operable to, in order to check an abnormal state of a

logic function for operating the control signal based on the predetermined detection

signal, operate a dummy control signal by using dummy data stored in advance in

accordance with the logic function and to determine whether or not a relationship

between the dummy control signal and an expected value of the dummy control signal,

which expected value is stored with respect to the dummy data in advance, is normal; and

a transmission unit operable to transmit the dummy control signal and the

expected value thereof that are used in a determination routine by the determination

routine unit to the second computer;

the second computer comprising:

a receiving unit operable to receive the dummy control signal and the expected

value thereof; and

a monitor routine unit operable to compare the dummy control signal and the

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expected value thereof received by the receiving unit so as to perform a calculation

routine for calculating monitor data for monitoring whether or not a result of the

determination routine by the determination routine unit is correct;

wherein the electronic control unit further comprises: a fail-safe routine unit

operable to perform a fail-safe routine based on the determination result by the

determination routine unit and the monitor data by the monitor routine unit;

the logic function includes a first logic function for operating the control signal

based on the predetermined detection signal and a second logic function, for operating a

simplified control signal based on the predetermined detection signal;

the determination routine unit further determines whether or not a relationship

between the control signal operated in accordance with the first logic function and the

simplified control signal operated in accordance with the second logic function is normal;

and

in a case where the determination routine unit determines that the relationship

between the control signal and the simplified control signal is not normal, or in a case

where the monitor routine unit calculates the monitor data indicating that it is to be

determined in the determination routine by the determination routine unit that the

relationship between the control signal and the simplified control signal is abnormal,

when the determination routine unit determines that the relationship between the dummy

simplified control signal and the expected value thereof is normal and the monitor routine

unit calculates the monitor data indicating that it is to be determined in the determination

routine by the determination routine unit that the relationship between the dummy

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simplified signal and the expected value thereof is normal, the fail-safe routine unit

performs a fail-safe routine for controlling the object of control using the simplified

control signal.

9.   (previously presented) The electronic control unit according to claim 4,
wherein

the determination routine unit inputs the dummy data to the second logic function

to operate a dummy simplified control signal and determines whether or not a

relationship between the dummy simplified control signal and an expected value thereof

is normal.

10.   (previously presented) The electronic control unit according to claim 5,
wherein

the logic function includes a first logic function for operating the control signal

based on the predetermined detection signal and a second logic function, for operating a

simplified control signal based on the predetermined detection signal, and

the determination routine unit further determines whether or not a relationship

between the control signal operated in accordance with the first logic function and the

simplified control signal operated in accordance with the second logic function is normal.

11.   (previously presented) The electronic control unit according to claim 10,

wherein

the determination routine unit inputs the dummy data to the second logic function

to operate a dummy simplified control signal and determines whether or not a

relationship between the dummy simplified control signal and an expected value thereof

is normal.

12.   (previously presented) The electronic control unit according to claim 6,

wherein

the logic function includes a first logic function for operating the control signal

based on the predetermined detection signal and a second logic function, for operating a

simplified control signal based on the predetermined detection signal, and

the determination routine unit further determines whether or not a relationship

between the control signal operated in accordance with the first logic function and the

simplified control signal operated in accordance with the second logic function is normal.

13.   (previously presented) The electronic control unit according to claim 12,

wherein

the determination routine unit inputs the dummy data to the second logic function

to operate a dummy simplified control signal and determines whether or not a

relationship between the dummy simplified control signal and an expected value thereof

is normal.

14.   (previously presented) The electronic control unit according to claim 8,

wherein

the determination routine unit inputs the dummy data to the second logic function

to operate a dummy simplified control signal and determines whether or not a

relationship between the dummy simplified control signal and an expected value thereof

is normal.

15.-17. (canceled)

18.   (currently amended)   A method of controlling an electronic control unit

having at least a first computer and a second computer to output a control signal for an

object of control based on a predetermined detection signal, the method comprising:

operating the first computer to:

operate the control signal based on the predetermined detection signal in

accordance with a logic function;

in order to check an abnormal state of the logic function, operate a dummy

control signal by using dummy data stored in advance in accordance with the

logic function and determine whether or not a relationship between the dummy

control signal and an expected value of the dummy control signal, which expected

value is stored with respect to the dummy data in advance, is normal; and

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transmit the dummy control signal and the expected value thereof that are

used in a determination routine by the first computer to the second computer;

operating the second computer to:

receive the dummy control signal and the expected value thereof; and

compare the received dummy control signal and the expected value so as

to perform a calculation routine for calculating monitor data for monitoring

whether or not a result of the determination routine by the first computer is

correct;

performing a fail-safe routine based on the determination result by the first

computer and the monitor data by the second computer;

wherein the logic function includes a first logic function for operating the control

signal based on the predetermined detection signal and a second logic function, for

operating a simplified control signal based on the predetermined detection signal, and

the first computer further determines whether or not a relationship between the

control signal operated in accordance with the first logic function and the simplified

control signal operated in accordance with the second logic function is normal,

~~The method according to claim 16, wherein~~ the control signal and the simplified

control signal, as well as the dummy control signal and the expected value thereof, is

transmitted to the second computer, and

the second computer further compares the control signal with the simplified

control signal to perform a calculation routine for calculating the monitor data for

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monitoring whether or not a result of the determination routine in the first computer is

correct.

19.   (currently amended)   A method of controlling an electronic control unit

having at least a first computer and a second computer to output a control signal for an

object of control based on a predetermined detection signal, the method comprising:

operating the first computer to:

operate the control signal based on the predetermined detection signal in

accordance with a logic function;

in order to check an abnormal state of the logic function, operate a dummy

control signal by using dummy data stored in advance in accordance with the

logic function and determine whether or not a relationship between the dummy

control signal and an expected value of the dummy control signal, which expected

value is stored with respect to the dummy data in advance, is normal; and

transmit the dummy control signal and the expected value thereof that are

used in a determination routine by the first computer to the second computer;

operating the second computer to:

receive the dummy control signal and the expected value thereof; and

compare the received dummy control signal and the expected value so as

to perform a calculation routine for calculating monitor data for monitoring

whether or not a result of the determination routine by the first computer is

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correct;

performing a fail-safe routine based on the determination result by the first computer and the monitor data by the second computer;

~~The method according to claim 15,~~ wherein a plurality of types of the dummy data are prepared;

when the first computer determines that the relationship between the dummy control signal and the expected value thereof is normal, the first computer repeats the determination routine while changing the plurality of types of dummy data; and

when the first computer determines that the relationship between the dummy control signal and the expected value thereof is abnormal in the previous determination routine, the first computer operates the dummy control signal by using the same dummy data as that used in the previous determination routine and determines whether or not the relationship between the thus calculated dummy control signal and the expected value thereof is normal again.

20.   (currently amended)   A method of controlling an electronic control unit having at least a first computer and a second computer to output a control signal for an object of control based on a predetermined detection signal, the method comprising:

operating the first computer to:

operate the control signal based on the predetermined detection signal in accordance with a logic function;

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in order to check an abnormal state of the logic function, operate a dummy

control signal by using dummy data stored in advance in accordance with the

logic function and determine whether or not a relationship between the dummy

control signal and an expected value of the dummy control signal, which expected

value is stored with respect to the dummy data in advance, is normal; and

transmit the dummy control signal and the expected value thereof that are

used in a determination routine by the first computer to the second computer;

operating the second computer to:

receive the dummy control signal and the expected value thereof; and

compare the received dummy control signal and the expected value so as

to perform a calculation routine for calculating monitor data for monitoring

whether or not a result of the determination routine by the first computer is

correct;

performing a fail-safe routine based on the determination result by the first

computer and the monitor data by the second computer;

~~The method according to claim 15,~~ wherein in a case where it is determined, in

the determination by the first computer whether the relationship between the dummy

control signal and the expected value thereof is normal or abnormal, that the relationship

is abnormal a predetermined number of times, or in a case where the monitor data

indicating that the determination routine by the first computer is to determine that the

relationship between the dummy control signal and the expected value thereof is

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abnormal is calculated in the second computer a predetermined number of times, the

abnormal state of the determination routine is settled and different fail-safe routines are

performed before and after settlement of the abnormal state, respectively.

21.   (previously presented) The method according to claim 20, wherein

the fail-safe routine allows the output of the control signal to the object of control

before the settlement of the abnormal state, and prohibits the control of the object of

control by the control signal after settlement of the abnormal state.

22.   (currently amended)   A method of controlling an electronic control unit

having at least a first computer and a second computer to output a control signal for an

object of control based on a predetermined detection signal, the method comprising:

operating the first computer to:

operate the control signal based on the predetermined detection signal in

accordance with a logic function;

in order to check an abnormal state of the logic function, operate a dummy

control signal by using dummy data stored in advance in accordance with the

logic function and determine whether or not a relationship between the dummy

control signal and an expected value of the dummy control signal, which expected

value is stored with respect to the dummy data in advance, is normal; and

transmit the dummy control signal and the expected value thereof that are

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used in a determination routine by the first computer to the second computer;

operating the second computer to:

receive the dummy control signal and the expected value thereof; and

compare the received dummy control signal and the expected value so as

to perform a calculation routine for calculating monitor data for monitoring

whether or not a result of the determination routine by the first computer is

correct;

performing a fail-safe routine based on the determination result by the first

computer and the monitor data by the second computer;

wherein the logic function includes a first logic function for operating the control

signal based on the predetermined detection signal and a second logic function, for

operating a simplified control signal based on the predetermined detection signal, and

the first computer further determines whether or not a relationship between the

control signal operated in accordance with the first logic function and the simplified

control signal operated in accordance with the second logic function is normal,

~~The method according to claim 16, wherein~~ in a case where the first computer

determines that the relationship between the control signal and the simplified control

signal is not normal, or in a case where the second computer calculates the monitor data

indicating that it is to be determined in the determination routine by the first computer

that the relationship between the control signal and the simplified control signal is

abnormal, when the first computer determines that the relationship between the dummy

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simplified control signal and the expected value thereof is normal and the second

computer calculates the monitor data indicating that it is to be determined in the

determination routine by the first computer that the relationship between the dummy

simplified signal and the expected value thereof is normal, a fail-safe routine is

performed for controlling the object of control using the simplified control signal.